WHAT IS CLAIMED IS:

1. A measuring device, comprising:

a camera adapted to generate images of an item being measured; and

a processor operatively associated with the camera and adapted to calculate the volume of the item based on the images.

2. The measuring device of claim 1, wherein the processor is adapted to identify an outline of the item and divide the outline into a plurality of two dimensional slices, each slice having a first dimension of a constant value and a second dimension of variable value.

3. The measuring device of claim 2, further including a rotatable platform upon which the item is placed and rotated through 360° of rotation, and wherein the camera is adapted to generate a plurality of digital images of the item across 360° of rotation.

4. The measuring device of claim 3, wherein the platform rotates in N steps around 360° of rotation, and wherein the camera generates N images of the item.

5. The measuring device of claim 4, wherein the processor calculates the volume of the item using the equation:

$$\text{volume} = \sum_{n=1}^{N} \sum_{m=1}^{M} 1/N \times h \times \prod \times (W_{mn}/2),$$

wherein h equals slice height, w equals slice width, N equals the total number of images, and M equals the total number of slices.

6. The measuring device of claim 3, wherein the rotatable platform is connected to a stepper motor.

7. The measuring device of claim 3, further including an isolation chamber, and wherein the rotatable platform and item are positioned within the isolation chamber.

8. The measuring device of claim 7, further including an opaque background within the isolation chamber.

9. The measuring device of claim 1, further including a display, the display adapted to communicate the calculated volume to a user.

10. The measuring device of claim 9, wherein the item volume is calculated before and after an event, and wherein the volumes before and after the event are viewable on the display.

11. The measuring device of claim 10, wherein the before and after volumes are displayed utilizing a different image with pixels j_{xy} with the formula:

$$j_{xy} = \frac{I_{hm}}{I_m}\left(k_{xy} - ixy\right) + I_{hm},$$

where I_m represents maximum pixel intensity, I_{hm} represents half of the maximum pixel intensity, i_{xy} represents pixel intensities before the change in volume, and k_{xy} represents pixel intensities after the change in volume.

12. The measuring device of claim 10, wherein the volumes before and after the event are displayed as three dimensional representations of the item.

13. The measuring device of claim 12, wherein the volumes before and after are displayed repeatedly in alternating fashion.

14. The measuring device of claim 10, wherein the event is shrinkage of the item.

15. The measuring device of claim 14, wherein the item is a dental material, and the shrinkage occurs as a result of polymerization due to exposure of the item to light.

16. The measuring device of claim 7, wherein the slices are horizontal, each slice has a height of one pixel and a width calculated by the processor by counting the number of pixels in each slice above a threshold level of intensity.

17. The measuring device of claim 2, wherein the slices are horizontal, each slice has a height of one pixel, and a width calculated by identifying the left most and right most pixels in the slice above a threshold level of intensity, and using the following equation:

$$W_m = (x_{mR} - x_{mL}) + 1,$$

wherein W_m represents slice width, x_{mR} represents the right most pixel and x_{mL} represents the left most pixel.

18. A volumetric measuring device, comprising:

a platform adapted to support an item to be measured and rotate the item in N increments across a 360° range of rotation;

a camera positioned proximate the platform and adapted to generate N images of the item;

a processor operatively associated with the camera and adapted to identify outlines of the item in each image, the processor being further adapted to calculate the volume of the item by calculating a volume associated with each image and adding the volumes associated with each of the N images; and

a display device operatively associated with the processor and adapted to display information associated with the calculated volume.

19. The volumetric measuring device of claim 18, wherein the camera is a charge-coupled device.

20. The volumetric measuring device of claim 18, wherein the platform is connected to a stepper motor.

21. The volumetric measuring device of claim 18, wherein the display device is a monitor adapted to display three-dimensional images representative of the item.

22. The volumetric measuring device of claim 18, further including an isolation chamber, the platform and camera being within the isolation chamber.

23. The volumetric measuring device of claim 22, further including an opaque background within the isolation chamber.

24. The volumetric measuring device of claim 23, further including at least one light source, the at least one light source being adapted to illuminate the item and not the background.

25. A method of calculating the volume of a sample, comprising the steps of:

recording camera images of the sample from N angles, the N angles totaling 360°;

digitizing the images on a pixel grid;

identifying an outline of the sample by identifying the pixels within the grid above a predetermined threshold intensity for each image;

dividing the image into a plurality of parallel slices;

tabulating the height and width of each slice;

calculating a volume associated with each slice; and

summing the calculated volumes associated with each slice for each of the N images.

26. The method of claim 25, wherein each slice includes a plurality of portions and wherein the method further includes the step of calculating the volume of each slice portion before calculating the volume of each slice.

27. The method of claim 25, wherein the recording step is performed by placing the item on a platform, rotating the platform in N increments, and recording an image at each increment of rotation.

28. The method of claim 25, wherein the height tabulation step is performed by dividing the outline into a plurality of slices wherein each slice has a height of one pixel.

29. The method of claim 28, wherein the width calculation step is performed by counting the number of pixels within each slice above the threshold intensity.

30. The method of claim 29, wherein the calculating the volume step is performed using the equation:

$$v_s = 1 / N \times h \times \prod \times (W_{mn} / 2)^2,$$

wherein v represents the volume of the slice portion represented in the view, N represents the total number of images, h represents the height of the slice, and w_{mn} equals the width of the slice.

31. The method of claim 30, wherein the summing step is performed using the equation:

$$v_t = \sum_{n=1}^{N} \sum_{m=1}^{M} 1 / N \times h \times \prod \times (W_{mn} / 2)^2,$$

wherein v_t represents total sample volume and M represents the number of slices in each image.

32. The method of claim 25, further including the steps of changing the sample volume, repeating the recording, digitizing, identifying, dividing, tabulating, calculating and summing steps, and determining a percent change in sample volume before and after the changing step.

33. The method of claim 32, wherein the sample is a dental material and the changing step reduces the sample volume by curing the material upon exposure to light.

34. The method of claim 32, further including the step of displaying the change in volume on an operator interface device.

35. The method of claim 34, wherein the displaying step is performed by repeatedly displaying before and after images of the sample.

36. The method of claim 34, wherein the displaying step is performed by simultaneously displaying before and after images of the sample.

37. The method of claim 32, wherein the determining step is performed using the equation:

$$_{\Delta}\%v_t = 100 \times (v_1 - v_2) / v_1 ,$$

wherein v_1 represents total sample volume before the changing step, and v_2 represents total sample volume after the changing step.

38. A method of calculating a volume of a sample comprising the steps of:

recording a camera image of the sample;

tabulating a volume associated with the image; and

calculating the volume of the sample based on the tabulated volume associated with the image.

39. The method of calculating a volume of a sample of claim 38, further including the step of digitizing the camera image, dividing the digitized image into a series of slices, determining the width and height of each slice in terms of pixels, and calculating a slice volume based on the width and height before performing the tabulating step.

40. The method of calculating a volume of a sample of claim 39, wherein each pixel has an intensity and wherein at least one of the height and width are determined by comparing each pixel intensity to a threshold level of intensity.